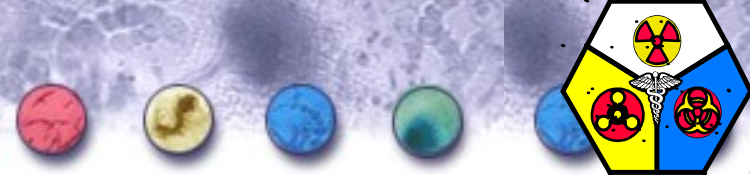


Medical NBC Briefing Series ***Medical NBC Aspects of*** **Influenza**





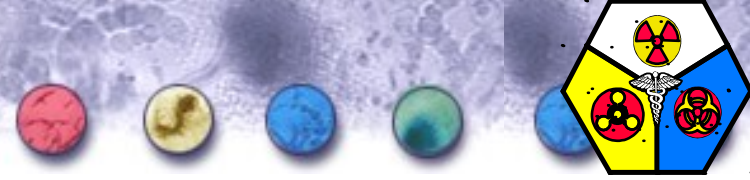
Purpose

- ***This presentation is part of a series developed by the Medical NBC Staff at The U.S. Army Office of The Surgeon General.***
- ***The information presented addresses medical issues, both operational and clinical, of various NBC agents.***
- ***These presentations were developed for the medical NBC officer to use in briefing either medical or maneuver commanders.***
- ***Information in the presentations includes physical data of the agent, signs and symptoms, means of dispersion, treatment for the agent, medical resources required, issues about investigational new drugs or vaccines, and epidemiologic data.***
- ***Notes page.***



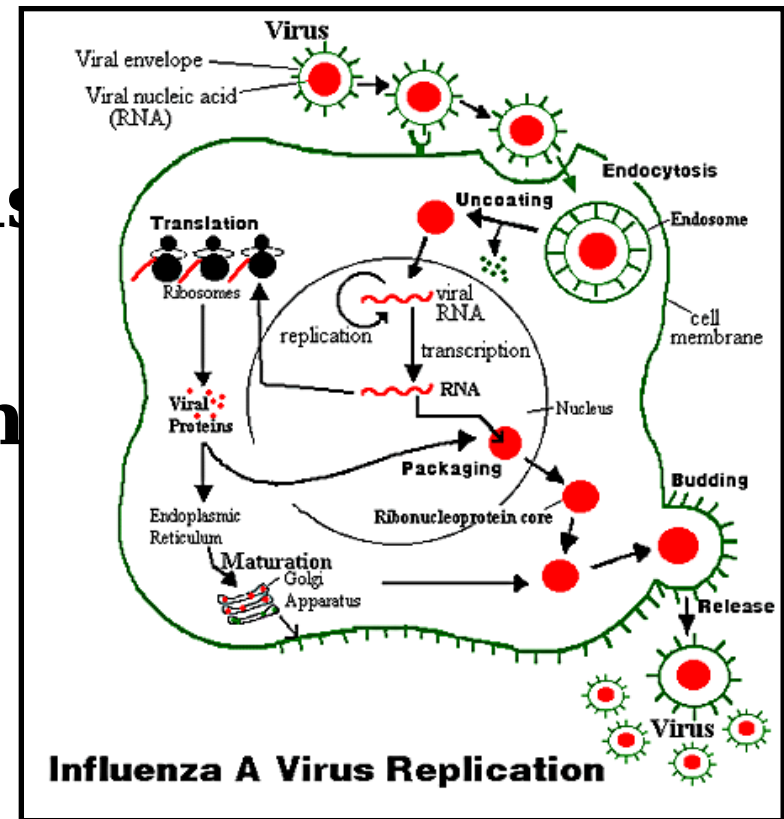
Office of the Surgeon General
for the Army

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Outline

- **Background**
- **Battlefield Response**
- **Medical Response**
- **Command and Control**
- **Summary**
- **References**

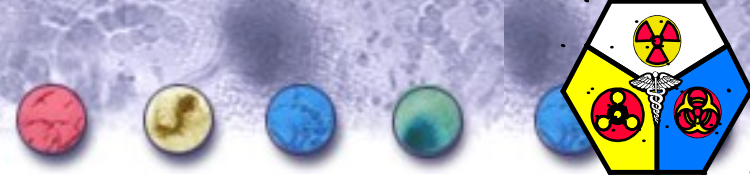




Background

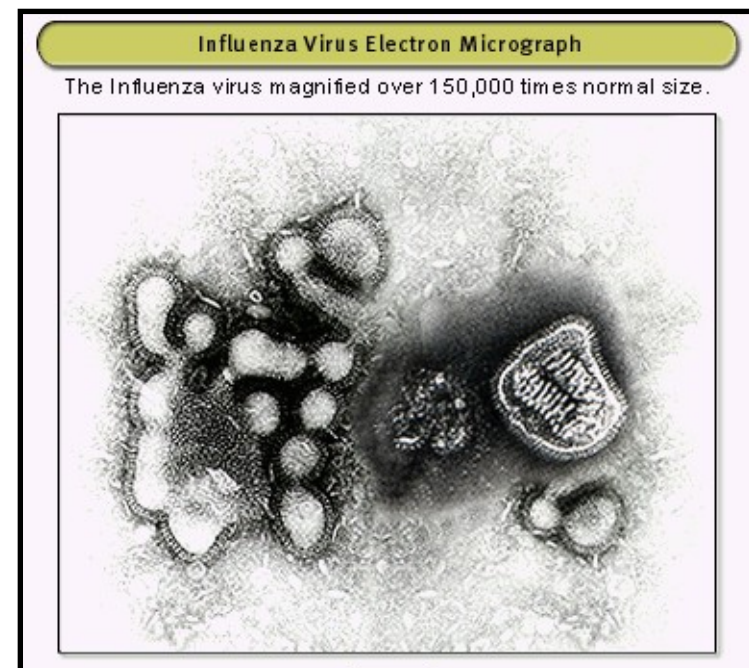
- **Disease Background**
- **Disease Course Summary**
- **Signs and Symptoms**
- **Diagnosis**
- **Treatment**
- **Current Situation**
- **Weaponization**

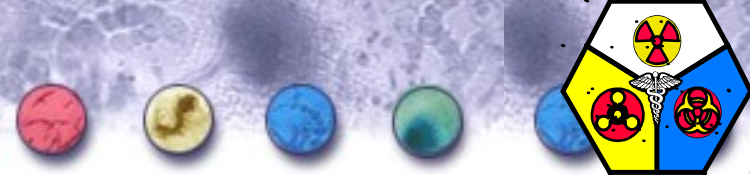




Disease Background

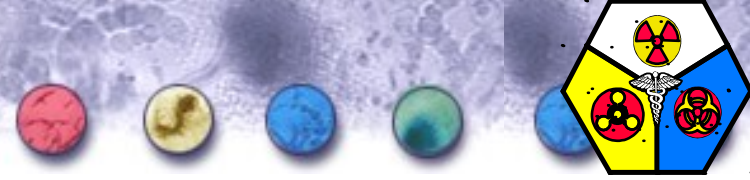
- Transmitted person-to-person through aerosol.
- Three influenza types are A, B, and C.
- Influenza viruses A and B belong to the genus *Influenzavirus*, while influenza C belongs to the *Influenza C* genus.
- There have been at least 31 recorded influenza pandemics since they were first described by Hippocrates in 412 B.C.
- The Spanish Flu of 1918 caused more than 20 million deaths worldwide.





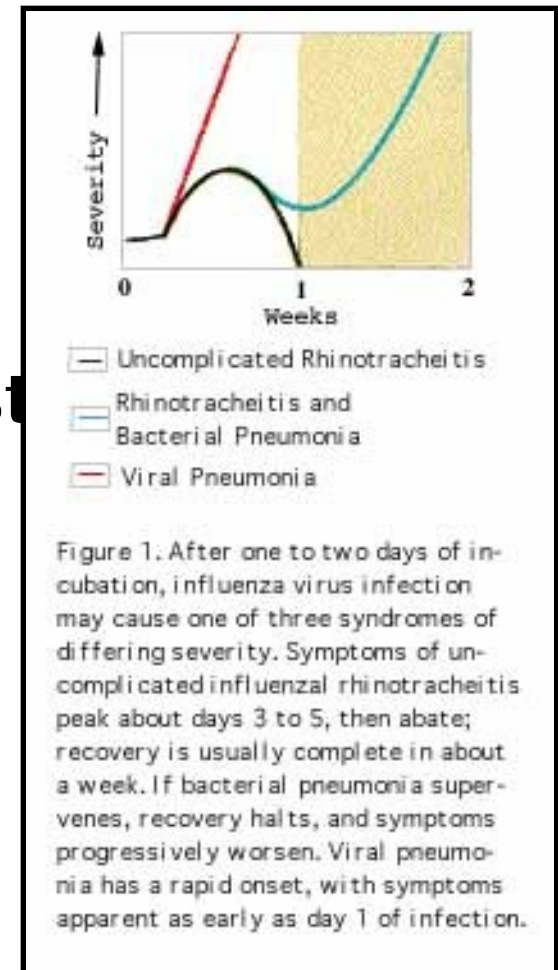
Disease Course Summary for Influenza in Untreated Individuals

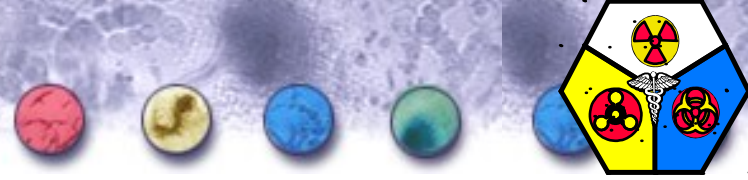
Day 1 EXPOSURE	Day 2	Day 3	Day 4	Day 5	Day 6 Systemic illness abates and respiratory symptoms become more apparent	Day 7
Rapid onset		Fever, chills, and headache				
Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
Sore throat, persistent nonproductive cough, fatigue, and asthenia						
Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21
NOTE: Secondary infection possible throughout ill causing bacterial or viral pneumonia, which may lead to death.						
Day 22	Day 23	Day 24	Day 25	Day 26	Day 27	Day 28



Signs and Symptoms

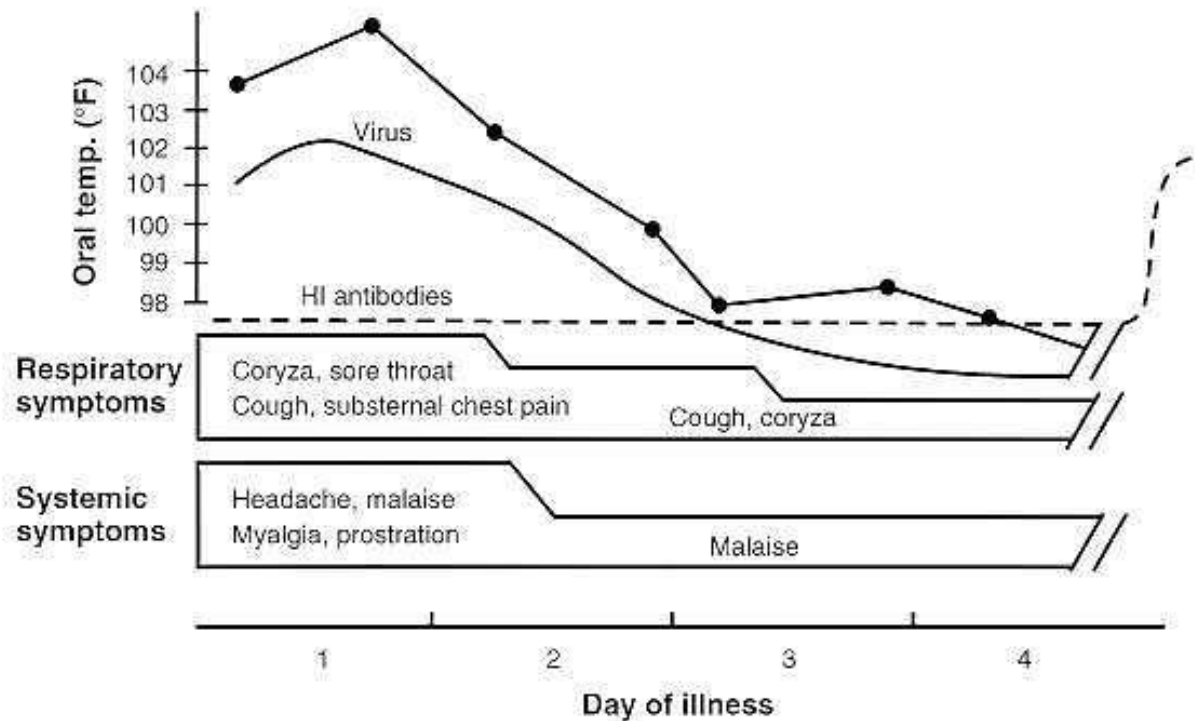
- **Rapid onset**
- **Fever, chills, muscle aches, and headache dominate during the first several days of illness**
- **Respiratory complaints are sore throat and cough**
- **Possible secondary complications**

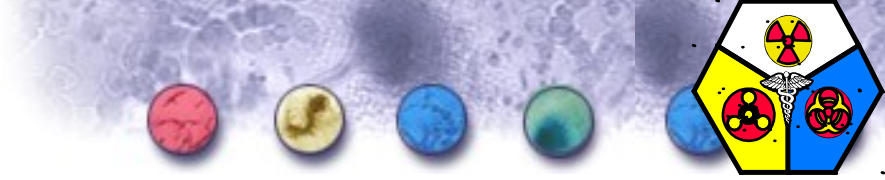




Diagnosis

- **Usually based on physical exams**
- **Laboratory test include the following:**
 - Checking for antibody titers
 - Culturing the virus

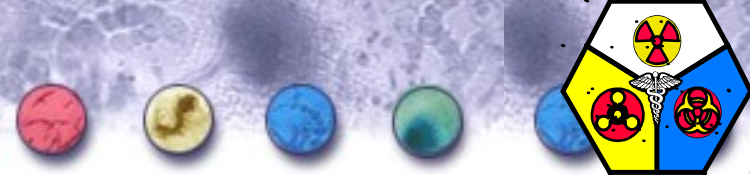




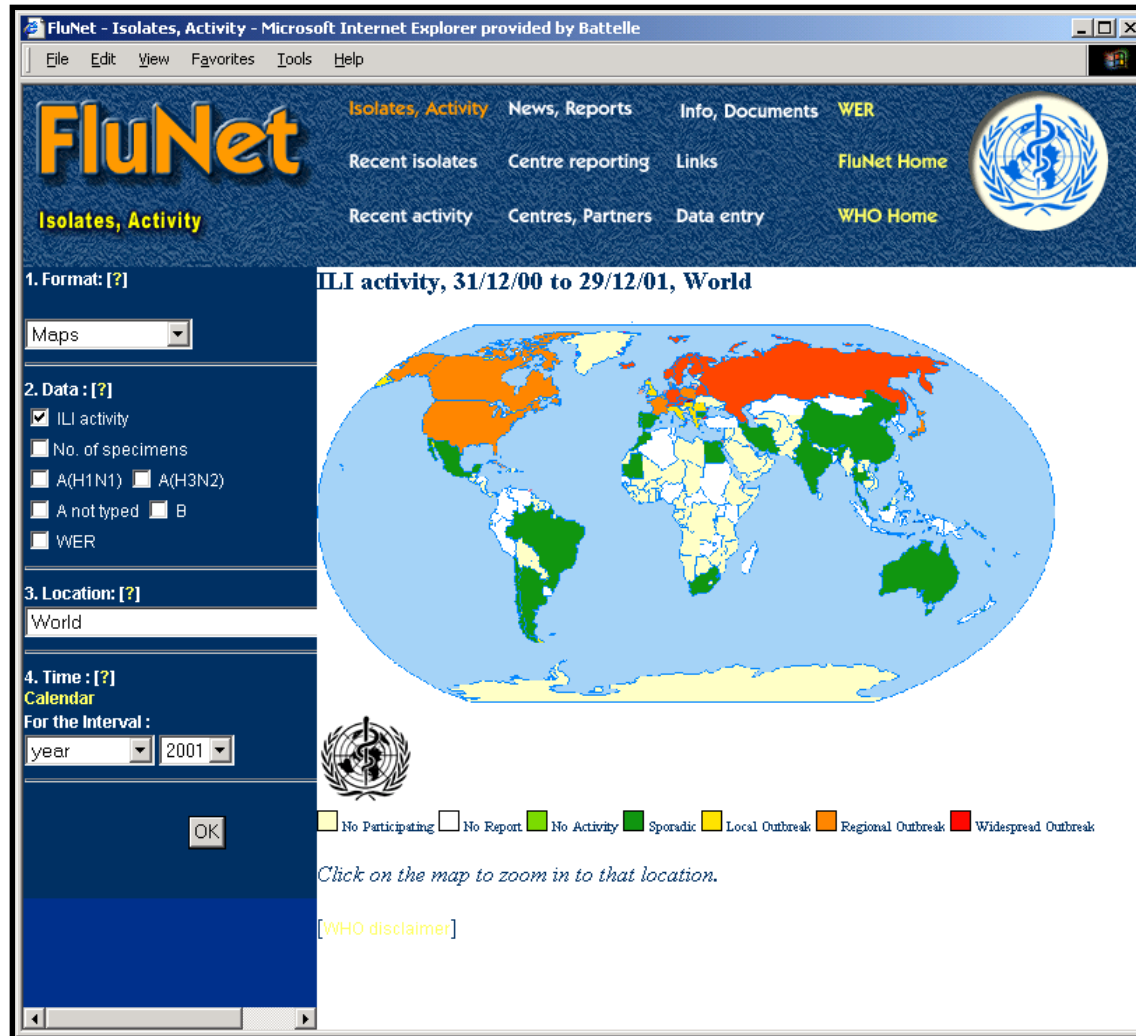
Treatment

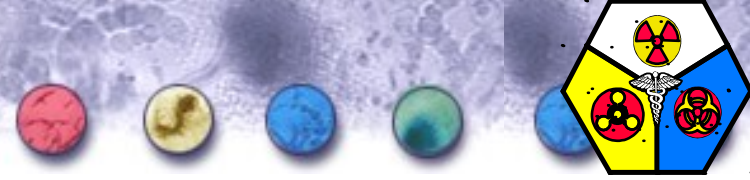
- **Primarily supportive care**
 - Drink plenty of fluids
 - Acetaminophen (Tylenol) to relieve fever and discomfort
 - Antibiotics are NOT effective
 - Hospitalization of patients with advanced symptoms
- **Antiviral**





Current Situation

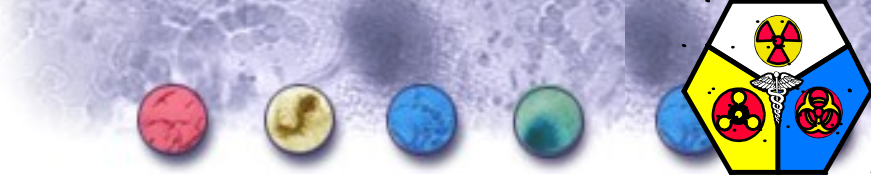




Weaponization

- **Aerosolization**
 - Highly infectious via aerosol
 - Delivery systems can be simple such as spray systems or stationary munitions
 - Virus may persist for hours, particularly in cold temperatures and low humidity
- **No evidence of weaponization**

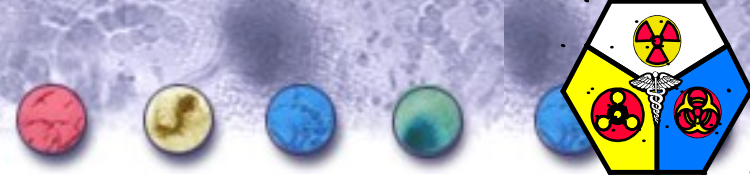




Battlefield Response to Influenza

- **Detection**
 - Environmental detection
 - Clinical detection
 - Medical surveillance
- **Protection**
 - Vaccination
 - Individual protection
 - Collective protection





Detection

- **Possible methods of detection**
 - Detection of agent in the environment
 - Clinical (differential diagnosis)
 - Medical surveillance (coordination enhances detection capability)
- **Diagnosis of influenza is not presumptive of a BW attack. The disease is endemic worldwide and very common.**

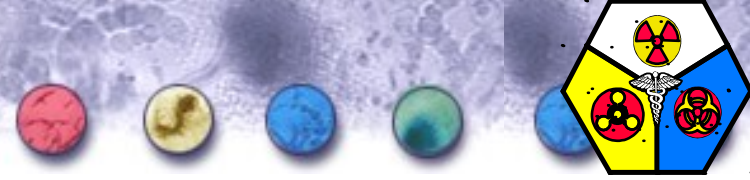




Detection of Agent in the Environment

- **Biological Smart Tickets**
- **Enzyme Linked Immunosorbant Assay (ELISA) (Fielded with the 520th TAML)**
- **Polymerase Chain Reaction (PCR) (Fielded with the 520th TAML)**

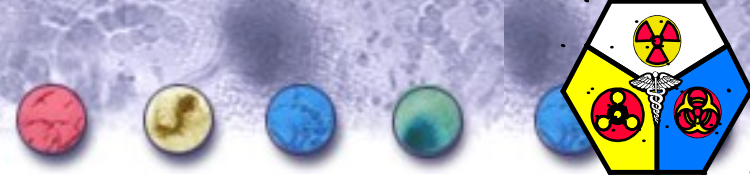




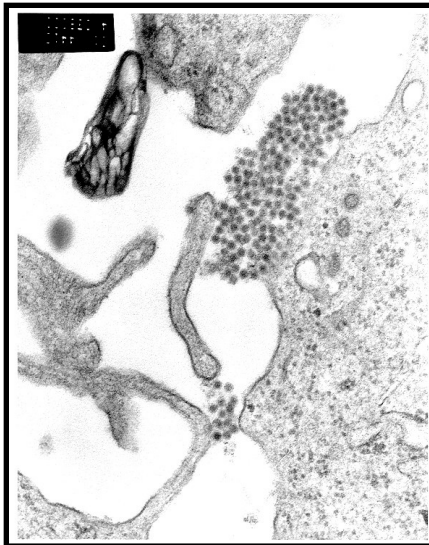
Detection of Agent in the Environment (cont.)

- **M31E1 Biological Integrated Detection System (BIDS)**
- **Interim Biological Agent Detector (IBAD)**





Clinical Detection



- **Clinical presentation**

- Physician can presumptively diagnose influenza based on a physical exam and symptoms
- Rapid onset of fever, chills, muscle aches, and headache
- Sore throat and cough as illness progresses

- **Laboratory confirmation**

- Division medical assets may lack lab equipment to conduct test to determine influenza
- Specimen must be sent to theater level or CONUS lab
- Contact lab prior to collection or preparation in order to assure proper methods are utilized



Detection by Medical Surveillance



MARYLAND ARMY NATIONAL GUARD
DISCOM 29th Infantry Division (Light)
DIVISION MEDICAL OPERATION CENTER (DMOC)



Patient Summary Report 29th INF (L) DIV

From: Division Medical Operations Center (DMOC)
To: Division Surgeon

Date Time Group: From: 121200RJUN99
To: 202400RJUN99

PATIENTS

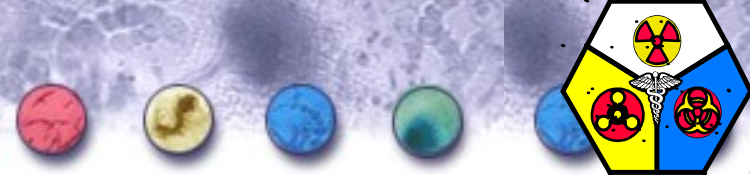
Nation	WIA	NBI	Disease	Neuropsychiatric Stress-Related	Total
US	0	97	55	0	152
Allied	0	0	0	0	0
EPW	0	0	0	0	0

DISPOSITION

Return to duty	148
Holding in Division's MTFs	0
Evacuated and returned	3
Evacuated by air	0
Evacuated by ground	1
Expired en route	0
Expired in MTF	0

Clues in the daily medical disposition reports

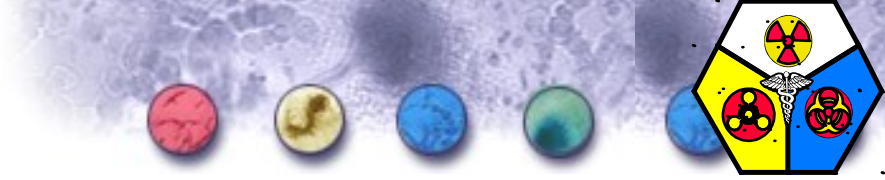
- Large numbers of individuals in the same geographic area presenting with the flu
- Flu appearing in vaccinated individuals (suggesting the appearance of a flu strain that was not expected for Jul



Protection by Vaccination

- Vaccination given to soldiers annually.
- Annual vaccine protects against the three virus strains most likely to spread that year.
- If the vaccine and circulating viruses are similar, the vaccine prevents illness in 70 percent of people.
- Caution: The annual vaccination may offer only limited protection against the strain released as BW.

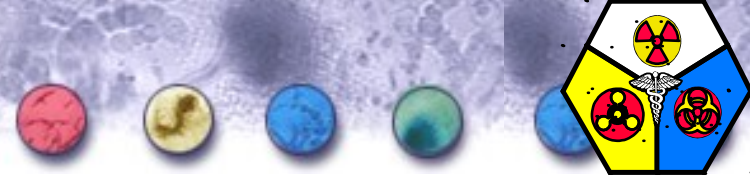




Individual Protection

- **Mask and BDO with gloves and boots**
- **Standard uniform clothing affords reasonable protection against dermal exposure to biological agents**
- **Casualties unable to wear MOPP should be handled in casualty wraps**





Collective Protection

- Hardened or unhardened shelter equipped with an air filtration unit providing overpressure
- Standard universal precautions should be employed as individuals are brought inside the collective protection units



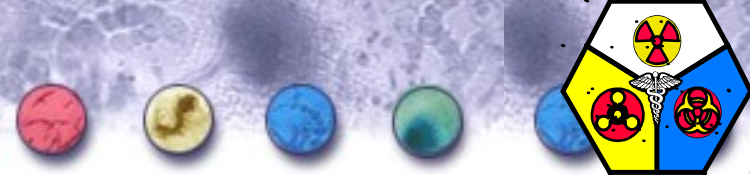
- Influenza is communicable from person to person



Medical Response to Influenza

- Triage and Evacuation
- Evacuation or Quarantine
- Infection Control
- Resource Requirements





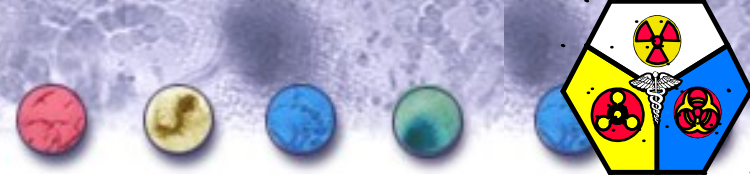
Triage and Evacuation

- **Triage**

- Priorities based on severity of symptoms
- Need to differentiate from other BW agents that presents with flu-like symptoms such as anthrax

- **Evacuation**

- Need for evacuation will depend on severity of symptoms and METT-T
- Standard infection control precautions during transport
- May consider treatment in place or even outpatient treatment for a mass casualty



Evacuation or Quarantine



Figure 8-6. Arms carry.

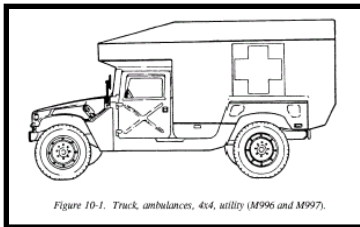


Figure 10-1. Truck, ambulances, 4x4, utility (M996 and M997).

- **Evacuation**

- Most patients will RTD in the normal theater evacuation policy of 15 days

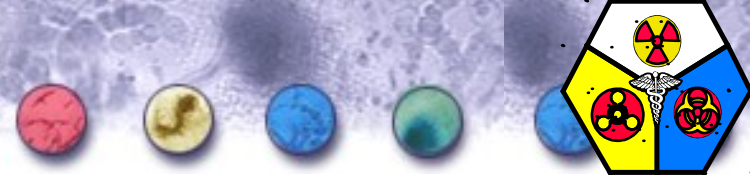
- **Quarantine**

- Depends on strain released; annual vaccination may offer limited protection against strain released as BW

- Limit spread of the given strain
- Unlike smallpox, influenza is already endemic worldwide

- **Guidance**

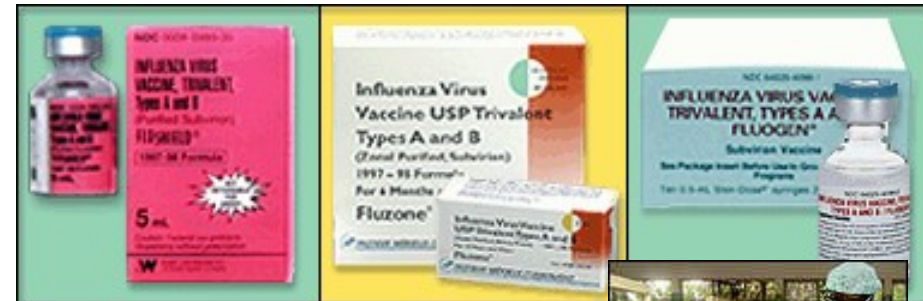
- Seek guidance from CINC and MTF Commanders before evacuating large numbers of patients

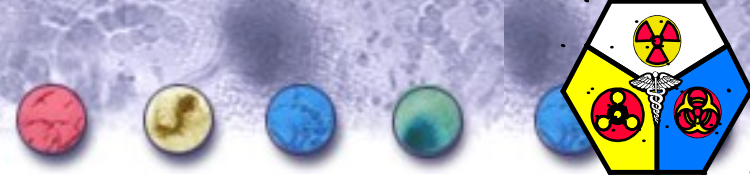


Infection Control



- Command responsibility
- Influenza is spread from person-to-person through infectious mists or sprays created by coughing or sneezing
- Use standard universal precautions during treatment
- Vaccination





Resource Requirements

- **Medication**
- **Vaccine**
- **Treatment facilities**
- **Supportive therapies**
- **Intensive care facilities for severely ill patients**
- **Possibility for in-theater treatment of large numbers of patients**
- **Infection control equipment for care provider**

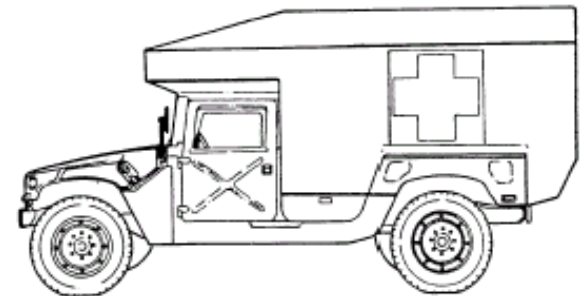
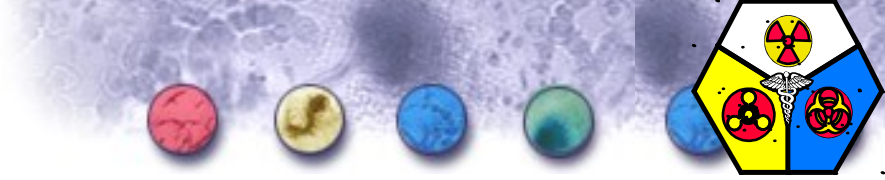


Figure 10-1. Truck, ambulances, 4x4, utility (M996 and M997).



Command and Control

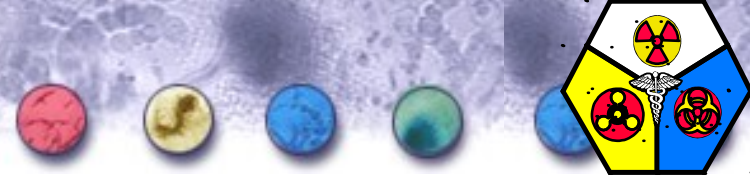
- **Intelligence**
 - Medical surveillance and intelligence reports are key to keep the Command alert to the situation
- **Outpatient treatment, In-theater treatment, or Evacuation**
- **Maneuver**
 - Annual vaccination may offer only limited protection against the strain released
- **Infection Control**
 - Command responsibility to ensure proper infection control, field sanitation, and personal hygiene measures
- **Manpower**
 - Large percentage of the fighting force may develop the disease



Command and Control Response to Psychological Impact

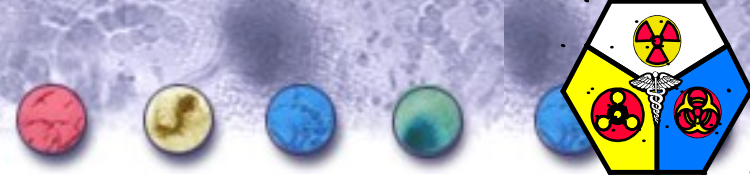


- **May vary from person to person**
- **Psychological Operations**
 - Rumors, panic, misinformation
 - Soldiers may isolate themselves in fear of disease spread
- **Countermeasures**
 - LEADERSHIP is responsible for countering psychological impacts through education and training of the soldiers
 - Implementation of defensive measures such as crisis stress management teams



Summary

- **Influenza is endemic worldwide and is transmitted person-to-person.**
- **The possibility for weaponization exists.**
- **Detection may not occur until after exposure when patients are reported.**
- **Command decisions that will be required upon detection of influenza:**
 - Far-forward treatment, treatment at MFT, or evacuation to CONUS?
 - Additional resources for far-forward treatment.
 - Additional resources for evacuation.



References

- Biological and Chemical Warfare Online Repository and Technical Holding System (BACWORTH), Version 3.0. Battelle Memorial Institute, 1997.
- Department of Defense, *Annual Report to Congress for Chemical and Biological Defense Program*, March 2000.
- Department of the Army. FM 8-10-6: *Medical Evacuation in a Theater of Operations*. April 2000.
- Department of the Army. FM 8-9: *NATO Handbook on the Medical Aspects of NBC Defensive Operations*, February 1996.
- Department of the Army. FM 21-10: *Field Hygiene and Sanitation*. November 1988.
- National Research Council and Institute of Medicine, *Chemical and Biological Terrorism, Research and Development to Improve Civilian Medical Response*, Washington DC: National Academy Press, 1999.
- *Scientific American Medicine*, edited by D. Dale and D. Federman, Scientific American Inc., 2001.
- Website for Access Excellence at the National Health Museum: www.accessexcellence.com/AB/GG/influenza.html.
- Website for Bayonet.Net: www.bayonet.net.
- Website for FluNet, Global Influenza Surveillance Network, developed in collaboration with the Institute for Medical Research and Health, Paris, France: oms2.b3e.jussieu.fr/flunet/activity.html.
- Website for the Army Medical Department Regiment, US Army: ameddregiment.amedd.army.mil/distinct.htm.
- Website for the Center for Disease Control and Prevention: www.cdc.gov/ncidod/diseases/flu/fluinfo.htm.
- Website for the University of Edinburgh, Edinburgh School of Biology, Biology Teaching Organisation: helios.bto.ed.ac.uk/bto/microbes/airborne.htm.
- Website for the Mount Sinai Hospital, Department of Microbiology, Toronto, Canada: microbiology.mtsinai.on.ca/Bug/flu/flu.htm.
- Website for the National Foundation for Infectious Diseases:



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